Road Map to the Year 2003

STATE OF CALIFORNIA
Department of Motor Vehicles
Strategic Information Technology Plan
July 1997

State of California
Department of Motor Vehicles

STRATEGIC INFORMATION TECHNOLOGY PLAN

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INTEGRATION OF BUSINESS AND

INFORMATION TECHNOLOGY STRATEGIES

In June 1993, DMV adopted a Strategic Business Plan (SBP) which established "quality customer service" as the cornerstone for all departmental programs and activities. The SBP provides the foundation for a departmental strategic planning process. It also establishes an ongoing, results oriented management process for integrating and transforming business processes into the SBP imperatives.

The successful operation of DMV's mission-critical business processes is dependent on the effective use of information technology (I/T). I/T is an essential core resource, with virtually unlimited potential, for effecting improvements in the department's business processes and related customer services.

To fully exploit the potential capabilities of existing, new and emerging technologies, DMV has adopted this Strategic Information Technology Plan (SITP). The primary objective of the SITP is to appropriately align the use of I/T so that maximum support can be given to the department's business processes. By integrating technology into the business planning and re-engineering activities, the department will have a powerful "enabler" for meeting its evolving business needs while leveraging its capacity for providing the best possible customer service.

Integration of business and I/T strategies will be accomplished through organizational changes that provide for the full participation of departmental management in the application of I/T. In addition, new partnerships between vendors, business managers and I/T managers are evolving which will further shift the focus from technology to business.

This SITP provides the vision and strategies to support the successful achievement of DMV's business goals. It is a commitment from the Information Systems Division to provide the department with business systems, driven by business requirements, which will culminate in providing the best possible customer service through deployment of efficient and effective information technology.

LEO F. VERHEUL, Chief Information Officer

California Department of Motor Vehicles

STATE OF CALIFORNIA

DEPARTMENT OF MOTOR VEHICLES

STRATEGIC INFORMATION

TECHNOLOGY PLAN

JUNE 1997

STATE OF CALIFORNIA
DEPARTMENT OF MOTOR VEHICLES
STRATEGIC INFORMATION TECHNOLOGY PLAN

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INTRODUCTION

The California Department of Motor Vehicles (DMV) is one of the largest departments in State service, serving the public through a network of 172 field offices throughout the State. More California residents have direct annual contact with us than with any other State department, giving us a key role in forming public perceptions of State government.

Over 8,000 DMV employees are responsible for titling and registering vehicles and vessels, licensing and monitoring drivers, regulating the motor vehicle industry, authenticating identification, collecting revenues, licensing and regulating vehicle-related businesses, and administering the State's financial responsibility law. We collect approximately $5.5 billion in revenues annually, nearly 90% of which is re-distributed to state and local government.

To fulfill our responsibilities, we have a large and complex information technology (IT) infrastructure. We maintain the largest databases of our kind in the United States, consisting of approximately 106 million (current and past) vehicle registration records, and 37 million (current and past) driver license and identification records. DMV computer systems for licensing and registration process over two million transactions per day.

The purpose of this Strategic Information Technology Plan (SITP) is to describe our strategic directions in information technology over the next three to five years.

BACKGROUND

Our business plans and future directions have been recently updated and refined in three inter-related planning efforts: 1) the 1996 *Strategic Business Plan*; 2) the *Director's Imperatives*; and 3) the *MONARCH Project*, our current business process reengineering (BPR) effort. These efforts are complementary, with emphases on improving customer service, improving business practices and operational effectiveness, and improving DMV coordination, communications, and performance.

Our *previous Strategic Information Technology Plan* was published in 1994. This Plan

resulted in a number of significant changes, including the implementation of the Information Technology Steering Committee, which has made business managers an integral part of IT decision-making at the highest level of the DMV. An analysis performed by an outside consulting firm resulted in the **Business Applications and Information Technology Independent Study**. This study further defined technology-related issues and action steps. It has served as the *de facto* strategic information technology plan since its publication in May, 1995. We have launched efforts in all areas identified in the Independent Study. Quarterly progress reports are provided to key oversight and control agencies.

We are heavily dependent on information technology to support our operations and fulfill our mission, and we face major challenges, including: an aging technology infrastructure; cumbersome and outmoded business processes; pressing current and future business mandates; and a future business vision that encompasses new and improved ways of providing DMV services.

INFORMATION TECHNOLOGY GOALS

Our primary information technology goals over the next three to five years are as follows:

Goal #1: *Successfully implement departmental projects with information technology components in a timely manner to meet statutory mandates and other identified business needs*

Goal #2: *Improve the responsiveness and cost-effectiveness of the information technology infrastructure*

Goal #3: *Support and improve business processes and overall customer service by exploring and implementing innovative information technology solutions*

Goal #4: *Establish and improve tools, methodologies, and practices to ensure high quality technology solutions*

Goal #5: *Improve the departmental organizational infrastructure for planning, implementing, and supporting information technology solutions*

FUTURE INFORMATION TECHNOLOGY DIRECTIONS

Future Architectural Vision

Our future technical architecture will be based on web-enabled, relational database management systems. The database management systems will be commercial off-the-shelf products with proven industry track records. The decision to move to relational database systems is based on the following reasons:

- Compared to several years ago, relational databases are more robust and are capable of higher levels of performance. In addition, more powerful hardware processors are available, reducing performance-related issues.

- Relational database management systems reduce software development/maintenance time by allowing business rules to be built directly into the database and enforcing a structured methodology

- Relational databases provide functional capabilities to meet key DMV business requirements with regard to maintainability, flexibility, and accessibility

- Relational databases have a dominating share of the overall database market

- Software development and maintenance resources will be available in the future, addressing concerns about diminishing resources to support the DMV's existing legacy systems

We will migrate away from the proprietary, mainframe-based systems. The current mainframe-based applications will be maintained, and modified in the future only as necessary for overriding business reasons. The DMV's primary IT focus will shift to the development and implementation of solutions based on the new architecture. These solutions will be complete, production systems implemented by a multidisciplinary DMV team, including business process reengineering resources. An initial implementation target is the Occupational Licensing System, which will serve as a proof of concept for future Driver Licensing and Vehicle Registration System efforts. We will implement an Intranet at the DMV within the year, and expect both Intranet and Internet solutions to play a prominent role in the future.

Future Information Technology Initiatives

Technology-related initiatives will be conducted in a phased manner, as follows:

Phase I - 1997-98

- Build and modify applications to meet current business and statutory mandates
- Conduct business process reengineering
- Improve IT methodologies and practices
  - *Continue Application Development Environment (ADE) Project*
  - *Improve project management practices*
- Implement Intranet at Headquarters
- Begin IT infrastructure improvements
  - *Upgrade front-end processing hardware (i.e., Series/1 processors)*
  - *Upgrade field office wide area network*
  - *Continue Year 2000 fixes*

Phase II - Begin in 1998-99

- Implement reengineered business processes
- Improve IT methodologies and practices
- Implement production system based on target architecture and standards (Occupational Licensing System)
- Continue IT infrastructure improvements
  - *Implement local area networks in field offices*
  - *Integrate and standardize local area networks at Headquarters*

Long-Range Objectives - 2002-03

- Reengineered key Licensing and Registration processes
- Flexible, maintainable application software
- High-speed networks capable of supporting graphics, images
- Standardized IT methodologies and practices
- Hardware platforms conforming to open systems standards
- Industry-standard, commercial off-the-shelf software tools and languages
- Relational database management systems

CONCLUSION

This Strategic Information Technology Plan outlines both a future vision of technology and a strategy to achieve the vision. It identifies key technology standards and directions, and identifies processes to determine additional standards. The implementation strategy is based on an incremental approach. An incremental approach decreases overall risk, and allows future phases to build upon the foundation of earlier successes. Besides applications which require immediate modifications to meet statutory mandates, our focus is on infrastructure upgrades, improvements in our IT methodologies and practices, and the implementation of production application systems based on our target technical architecture and standards.

SECTION I

INTRODUCTION

DEPARTMENT OF MOTOR VEHICLES

A.　　*THE BUSINESS OF THE DMV*

The California Department of Motor Vehicles (DMV) is one of the largest departments in State service, serving the public through a network of 172 field offices throughout the State. More California residents have direct annual contact with us than with any other State department, giving us a key role in forming public perception of State government.

The California driver license and personal identification (ID) cards are recognized as the official means of identification for Californians not only in the State, but also on a national and international basis. Our databases are critical resources for other government agencies and private industry. We are associated with, and involved with, some of the most critical issues facing government as a whole, including social services, immigration, law enforcement, drug abuse prevention, personal privacy and confidentiality of information.

Over 8,000 DMV employees are responsible for titling and registering vehicles and vessels, including licensing and monitoring drivers, regulating the motor vehicle industry, authenticating identification, collecting revenues, licensing and regulating vehicle-related businesses, and administering the state's financial responsibility law. Approximately 64% of our employees work in field sites. The remainder work in the Sacramento headquarters complex.

We are responsible for implementing provisions in the Vehicle Code and California Code of Regulations for driver licensing and vehicle registrations. Our products include over 26 million vehicle registrations, and over 800,000 vessel registrations, and 23 million driver licenses and identification cards. We collect approximately $5.5 billion in revenues annually, nearly 90% of which are re-distributed to state and local government. Our operational budget for fiscal year 1995/96 was $516 million. In addition, we license over 18,000 firms and 81,000 individuals in occupations as diverse as car salespersons, driving instructors, dismantlers and auto dealers; serve over 28 million customers annually in field offices; and respond to over 20 million public phone calls per year

We also maintain the largest databases of our kind in the United States, consisting of

approximately 106 million (current and past) vehicle registration records, and 37 million (current and past) driver license and identification records. This information is accessed by the California Highway Patrol, local law enforcement agencies throughout the State, federal law enforcement agencies such as the Federal Bureau of Investigation, the Internal Revenue Service, the California Department of Justice, the California Franchise Tax Board, and others. We have extensive involvement with private sector entities such as financial institutions, insurance companies, and others. We support over two million interactive inquiries and updates to our database each day.

The core services we provide - driver licensing (DL), vehicle registration (VR), and occupational licensing (OL) - are critical and highly visible to the people of California. At the same time, our activities are important to the business processes of numerous State and local government agencies (e.g., law enforcement, revenue management). Thus, we acknowledge our responsibilities and our unique position as the State government agency that, by far, has the most personal contact with the residents of California.

Our business plans and future directions have been recently updated and refined in three inter-related planning efforts: 1) the 1996 Strategic Business Plan; 2) the Director's Imperatives; and 3) the MONARCH Project, our current business process reengineering effort. The illustration on the following page shows the consistency in themes between these efforts.

Director's Vision

We will provide first-class Customer Service

We will plan and operate with a bias for action

We will achieve peak performance from all members of our DMV team

DMV Mission

Customer service as cornerstone of our operations

Efficient and effective business practices

Dedicated and skilled employees

Strategic Business Plan Vision

Customer service will continue to improve

Continue to improve operational efficiency and effectiveness

Internal customer service will be critical to success

Monarch Vision

Motivated and professional organization

Clear and secure processes are supported by up-to-date technologies

Active and effective role in communications, in the legislative process, and through innovative educational practices for employees and customers

OVERDRIVE THEMES

Once and Done
Versatile, motivated and professional employees at all levels
Effective two-way communications with employees and customers
Responsive, varied service delivery and payment options for all customers
Direct, straightforward, and secure processes
Rapid and responsive high-quality customer service
Integrated and flexible information systems
Value-added strategic partnerships
Efficient and cost-effective operations supported by well-defined performance measures

B. PURPOSE OF THE STRATEGIC INFORMATION TECHNOLOGY PLAN

The purpose of this Strategic Information Technology Plan (SITP) is to provide a road map for information technology-related initiatives over the next three to five years at the California Department of Motor Vehicles (DMV).

We have both pressing short-term and long-term requirements for improvements in information technology. The urgency of the need for improvement is driven by factors which fall into four primary categories:

- *Aging technology infrastructure:* Key components of our information technology (IT) infrastructure are obsolete and eroding, causing significant business impacts. These issues are causing significant business impacts to our customer service levels and revenue collection processes. We are faced with an aging IT infrastructure that severely constrains our ability to meet new business challenges and statutory mandates.

- *Cumbersome and outmoded business processes:* Our business processes have grown increasingly cumbersome and complex as our responsibilities have expanded in response to statutory mandates. Many business processes are partly automated and partly manual, involve redundant efforts, and/or involve multiple handoffs between work units. Customer service and perception are negatively impacted by these cumbersome processes and resultant delays in completing customer transactions.

- *Current and future business mandates:* Statutory mandates continue to change how we conduct business. As the organization which has the most extensive personal contact with the citizens of California, we are charged with implementing not only driver and vehicle-related mandates, but other mandates relating to a variety of issues such as voter registration, proof of insurance, and legal presence.

- *Future business vision:* In the past twelve months, we have: 1) updated our Strategic Business Plan; 2) published the Director's imperatives; and 3) conducted the first phase of our business process reengineering effort, the MONARCH project. From these planning efforts, a refined vision of our business has emerged. To implement the new business vision and accommodate new business directions in the future, the development of a new IT infrastructure that is both flexible and responsive is a fundamental requirement.

We recognize that information technology is a critical factor in our current operations and future business plans. According to our Strategic Business Plan, "technology will continue to be a key enabler of the Department's vision." Automation and technology will continue to be a vital part of our customer service focus and our general operations, particularly in service delivery alternatives such as field offices, auto clubs, electronic networks (e.g., the Internet),

and other offices that offer DMV services.

The scope of the SITP planning process covers our entire operation and organization, projecting three to five years into the future to identify our critical IT issues and requirements. Objectives of this plan include the following:

1. Summarize the DMV's strategic business vision
2. Describe current IT environment
3. Identify our target IT environment, and IT goals and objectives
4. Identify the incremental steps necessary to reach the target IT environment
5. Describe the linkage between technology and business, i.e., how technology will support the achievement of our business goals

SECTION II

INFORMATION TECHNOLOGY
MISSION AND VISION

DEPARTMENT OF MOTOR VEHICLES

A.   INFORMATION TECHNOLOGY MISSION

The Information Technology Mission of the DMV is:

- *To ensure the implementation of proven information technologies which are critical to support the DMV business strategy and to serve the California motoring public.*

- *To develop budgets, standards, policies and plans; to provide services, consultation, oversight, and implementation of appropriate technologies to support DMV information management activities in a cost-effective manner and in accordance with Vehicle Code and applicable regulations.*

- *To provide leadership and services to ensure secure, efficient, and effective quality life-cycle management of DMV information needed to support the changing department mission.*

B.   INFORMATION TECHNOLOGY VISION

The Information Technology's Vision for the future is as follows:

> *The vision for Information Technology at the DMV is to be recognized as proactive providers of the best IT leadership and service in the State with proven, timely and cost-effective information services responsive to our customers' current and future requirements.*

This vision is based on key business drivers for information technology that have been determined through our business planning efforts, as follows:

a)   Future system plans, upgrades, and modernization efforts should proceed in incremental, cost-effective steps based on an overall plan that can be closely monitored and managed to mitigate risk.

b)   Systems should be designed and implemented to reduce the complexity of business transactions for front line personnel, enabling them to serve as full-service customer representatives with streamlined access to all appropriate information and processes.

c)   The communications infrastructure should provide for future flexibility and expansion capabilities to facilitate internal/external communications and increased access to our information in a cost-effective manner.

d) Mission critical systems will continue to process heavy transaction volumes with a high level of performance and reliability.

e) Communications systems should facilitate secure and user-friendly:

- Internal communication between employees
- External communications with customers, business partners, contractors

f) Integrated mission-critical systems should support single-point-of-contact accessibility and functionality, including the use of a universal client identifier.

g) Technology will support the ability to measure the performance of employees and the efficiency/effectiveness of products and services.

h) Technology will be standardized, simplified, and streamlined to increase efficiency.

i) Proactive steps should be taken to promote the flexibility and expandability of systems to decrease cycle times and facilitate changes to meet changing business requirements.

j) Information technology will promote the accuracy, authenticity, and security of data by reducing redundant steps/data, providing user friendly systems, authenticating information, identifying customers, verifying data accuracy, and other means.

k) System modifications and additions should be based on comprehensive requirements analyses, and consideration of alternative and innovative approaches.

l) Technology will facilitate more efficient workflows, and reduce the amount of paper generated and managed.

m) Through the use of various public access technologies, customers will have access to key services twenty-four hours a day.

C.   KEY STEPS

Some of the key steps planned by the DMV in order to achieve the Vision include the following:

1.   Form partnerships
- Partner with business leaders in information technology
- Stand shoulder to shoulder – share risks, knowledge and success
- Emphasize training

2. ***Reorganize***
- Integrate information and strategic planning resources
- Design the organization to be function-driven
- Implement a direct chain of command to coordinate directions
- Empower managers to lead their organizations

3. ***Architect***
- Base architectural directions on market share leaders
- Utilize commercial, off-the-shelf products

4. ***Build***
- Facilitate the Intranet
- Facilitate business process reengineering
- Use effective project management

5. ***Maintain legacy systems***
- Change only when absolutely required for overriding business reasons
- Explore contract support, free current staff to learn future environment/tools

SECTION III

INFORMATION TECHNOLOGY ENVIRONMENT

DEPARTMENT OF MOTOR VEHICLES

In this section, we describe the technology environment at the DMV: where it is today, our vision for the future, and key initiatives to achieve our vision.

A.   PRINCIPAL APPLICATIONS

Outside observers tend to think of DMV applications such as Driver Licensing (DL) and Vehicle Registration (VR) as being simple and straightforward. In fact, numerous factors combine to make our applications both complex and dynamic.

Applications such as DL and VR must be available twenty-four hours a day for law enforcement, and therefore have demanding performance and reliability requirements. The business rules have been heavily modified over time, with many changes resulting from the linking of social programs such as child support and drug use prevention. Approximately $5.5 billion is collected and disbursed per year, creating the need for robust and accurate accounting systems. We are also continuously adding systems to support industries such as the rental car industry, and also improving information access to the general public, other states, and other entities.

Some of the key computer applications are as follows:

Vehicle and Vessel Registration (VR) - Establishes title and registration of vehicles and vessels in California and calculates various fees and taxes associated with vehicle/vessel ownership and usage. Retrieves individual and statistical VR information.

Driver License (DL) - Provides automated support for the issuance of driver licenses and identification cards, regulating/managing driver privileges, modifying driver and ID records, and retrieving individual and statistical driver and ID information.

Occupational Licensing (OL) - Provides automated support for the licensing of vehicle-related businesses (and individuals in those businesses).

International Registration Plan (IRP) - Provides automated support for the registration of vehicles which operate interstate and inter-country.

Information Access Control (IAC) - A database of all commercial and governmental request code holders, regulating their access authorizations.

Automated Billing for Information Services (ABIS) - Establishes accounts and issues invoices to those commercial entities that request information on driver license or vehicle registration records.

Remittance Processing System - Captures data entry of check processing for renewals to the DL and VR master files, and processes checks from commercial requesters of DL, VR, and OL information (who are billed by ABIS).

Accounting Resource Management System (ARMS) - Provides our general ledger system and the means to report, measure, and record the flow of money into and out of the DMV.

Automated Appointment System (AAS) - Allows a field office, phone center, or headquarters unit to schedule appointments for the public. Utilizes interactive voice response (IVR) technology to enable the public to schedule appointments.

Driver Safety - Provides automated support for our driving privilege regulatory arm, which includes performing quasi-judicial hearings to determine driving privileges in cases of physical or mental disability, skill disability, abuse of driving privileges, etc.

Business Partner Automation - Allows partners such as leasing and rental car companies, vehicle dealerships, and licensed registration services to perform many functions without directly dealing with a field office.

California Motor Vehicles Data Communications System (CAMVDCS) – Provides message switch functions for core applications such as DL and VR, including security functions.

These applications represent just a subset of our many computerized applications.

B. TECHNICAL ARCHITECTURES

A summary of key technical architectures is included below, including both the current environment and target future environment.

Database Architectures

Current Environment – The database architecture of the core applications was developed in-house several decades ago when processing speed was the overriding objective. Custom file indexes and file formats are used. The VR and DL files are indexed and stored

separately, with pointers between them for specific purposes. Implementing changes is time-consuming and difficult. Commercial database management systems such as ADABAS and SYBASE are used to support several smaller applications.

Future Environment – The future architecture will be based on a commercial, relational database management system. The database management system will be an off-the-shelf product with a proven industry track record. The database will be web-enabled, allowing the use of browsers and facilitating Internet/Intranet access. A relational database architecture is deemed appropriate for the following reasons:

- Compared to several years ago, relational databases are more robust and are capable of higher levels of performance. In addition, more powerful hardware processors are available, reducing performance-related issues.

- Relational database management systems reduce software development/maintenance time by allowing business rules to be built directly into the database and enforcing a structured methodology

- Relational databases provide functional capabilities to meet key DMV business requirements with regard to maintainability, flexibility, and accessibility

- Relational databases have a dominating share of the overall database market

- Software development and maintenance resources will be available in the future, addressing concerns about diminishing resources to support the DMV's existing legacy systems

Application Development Environment

Current Environment – The current application development environment is largely unstructured. Methodologies are inconsistent and often non-standard. Few automated development tools are used. Multiple programming languages are in use, with a heavy reliance on assembly language for core applications. Configuration management practices are limited and unstructured.

Future Environment – Application development methodologies, practices, and tools will be based on industry standards. IEEE standard #1074 was recently adopted as the foundation for the application development methodology. The current Application Development Environment (ADE) project is expected to establish standard guidelines and procedures. The first phase of the ADE project focuses on the implementation of a standard system development life-cycle (SDLC). Other concurrent efforts will focus on: quality assurance, validation and verification, configuration management, and other critical areas. Efforts are also underway to improve project management practices, with the Information Technology Steering Committee and the Project Management Office performing key roles.

Application Architecture

Current Environment – The current architecture of the core applications reflects a historical

emphasis on speed and reliability over flexibility and maintainability. Conventional software layers (e.g., transaction processing software, business rules, presentation software, tables, etc.) are intertwined and difficult to maintain. The core systems are designed vertically, with separate applications for VR and DL. Mainframe programs are written primarily in assembly language, are highly unstructured, and contain both duplicate and obsolete logic. Business rules are imbedded in these programs with limited documentation. Custom transaction processing software and a custom "message switch" (called the California Motor Vehicles Data Communications System, or CAMVDCS) are used. Currently, CAMVDCS cannot support "conversational" applications such as the International Registration Program, which is written in ADABAS/Natural. Core applications are supported by programming logic on both the back-end mainframe and on front-end Series/1 processors. The programming language on the Series/1s (the primary support for 172 field offices) is now obsolete.

The overall application architecture includes some use of commercial off-the-shelf application packages. Office automation software is standardized on Microsoft Office for both Macintoshes and PCs. Calendaring and electronic mail are now standardized on Meeting Maker and MS-Mail software.

Future Environment – The future architecture will be based on open systems principles and will utilize more industry-standard, commercial products. With the industry trend towards Internet/Intranet architectures, we will make extensive use of browsers and web-enabled database management systems. We will have an Intranet in production within a year. The existing legacy systems will be maintained, and modified in the future only as necessary for overriding business reasons. Past efforts to incrementally modify mainframe software layers have not proven to be cost-beneficial or productive. Our focus will shift to the implementation of production solutions based on the new architecture. The initial target is a new Occupational Licensing System. This effort will serve as a proof of concept for future efforts with the larger and more complex Driver Licensing and Vehicle Registration Systems.

Data Communications Architecture

Current Environment – Multiple networks are currently supported, with the following characteristics:

> *DMV Automation (DMVA) Network –* This network connects over 200 geographically dispersed sites, including all field offices. This wide area network utilizes CALNET and is supported by Teale Data Center. DMVA has a star configuration and utilizes IBM's SNA protocol. The network is relatively inflexible and low-performance, and does not have routing capabilities.

> *Direct Access Networks –* This is a collection of networks which link the DMV to external stakeholders such as: law enforcement (via the California Law Enforcement Telecommunications System, or CLETS); other motor vehicle departments (via the American Association of Motor Vehicles Administrators Network, or AAMVANet); rental car companies; local government (including courts); and others.

> *Headquarters Campus Network –* This is a diverse collection of local area networks serving DMV Headquarters with office automation and file transfer capabilities.

These networks include multiple topologies, network operating systems, and protocols. Due to the lack of standardization and integration, network management is difficult and time-consuming.

Driver Safety Network – This network includes twenty-two local area networks, including nineteen remote networks. The wide area network utilizes CALNET. The local area networks have standard topologies and operating systems.

Intranet/Internet – The Internet is used to provide broad access to DMV information. General information is disseminated, and forms are available for use by the public. No Intranet has been implemented at this time.

Data Architecture	**CURRENT** Custom file indexes, formats	→	**FUTURE** Relational database management system
Application Development Environment	**CURRENT** Unstructured, non-standard methodologies	→	**FUTURE** Standard, IEEE-based methodologies
Application Architecture	**CURRENT** Three-tiered legacy systems, custom software	→	**FUTURE** Commercial products, web-enabled databases
Data Communications Architecture	**CURRENT** Fragmented LANs; low-speed, inflexible WAN	→	**FUTURE** Integrated, high-speed network infrastructure
Hardware Architecture	**CURRENT** Aging legacy platforms, non-graphical field office terminals	→	**FUTURE** Powerful servers, graphical workstations

Future Environment – The future network architecture will be industry-standard and integrated. The DMVA network links to all field offices will be upgraded to frame relay technology. This will lower recurring costs, provide the potential for greater performance (capable of supporting images and photographs); and facilitate a transition to routable protocols, i.e., TCP/IP. Other network objectives include: standardization of operating systems; synchronization of network directories; improvements in network management systems; conversion to standard, routable network protocols; conversion to a standard topology (i.e., ethernet); and further exploration and utilization of the Intranet/Internet.

Hardware Architecture

Current Environment – Proprietary hardware and operating systems are heavily utilized. An IBM mainframe at Teale Data Center supports core applications, as well as approximately 350 Series/1 processors in field offices and at Headquarters. The Series/1 processors are obsolete and unreliable. Unisys servers are used to support the Remittance Processing application. More than 120 network servers are used, including both Intel-compatible servers and Apple Servers. End-user devices include Intel-compatible PCs (approximately 2,400), Apple Macintoshes (1,000), and dumb terminals (5,900). Many of the PCs have limited processing power (e.g., 80386 processors) and will require upgrades in the near future. The Immigration and Naturalization Service (INS) pilot project, which was developed as part of the MONARCH business process reengineering project, Phase I, utilizes PCs on the desktop in several field offices.

Future Environment – In the future, reliance on the mainframe will be phased out in favor of powerful servers. Series/1 processors will be replaced by open systems servers capable of running the current application software, but also providing development opportunities with off-the-shelf software packages and commercial tools. On the desktop, devices capable of supporting graphics will be used, including a combination of personal computers and network computers.

Organization and Staffing

Current Environment – The organizational structure for information technology currently includes the following components:

> *Formal IT Organization and Related Units* – The Information Systems Division (ISD) provides centralized support for the development, delivery, and maintenance of IT services. The Chief Information Officer (CIO) oversees this Division, and is providing leadership across the Department in communicating and implementing our information technology goals. Other technology-related units include: the Information Technology Office (responsible for researching and developing concepts for future uses of IT); the Project Management Office (which coordinates and guides project management efforts); and the Business Planning Office (which supports the MONARCH business process reengineering project, as well as coordinates strategic business planning efforts).
>
> *IT Committees* – The Information Technology Steering Committee (ITSC) provides business-directed leadership of IT, monitoring the progress of high priority projects

and the development of the Strategic Information Technology Plan. Other committees exist to coordinate standards, Internet applications, architectural decisions, and other topics.

IT Partnerships – Strategic partnerships exist with Teale Data Center, the Department of Justice, and vehicle-related industries. The use of external vendors and consultants has increased, including the areas of IT planning, verification and validation of projects, and technical/business consulting.

Future Environment – The Information Systems Division has recently been reorganized to facilitate support for new architectural directions. The new functional areas include: Mission Critical Applications; System Services; Re-Engineered Systems; Network Computing; Customer Service; Strategic Planning and Control; and Administration. The newly-created Project Management Office will work closely with both business and technical units to improve project initiation, estimation, tracking, and reporting. IT support functions will be outsourced wherever it is deemed cost-effective and appropriate.

C. ARCHITECTURAL AND ORGANIZATIONAL INITIATIVES

A summary of major architectural and organizational initiatives includes the following:

INITIATIVE	OBJECTIVE	STATUS
Database Architecture		
Convert to commercial DBMS	Convert to industry standard database management system	In planning
Application Development Environment		
ADE Project	Implement standard development life-cycle	In progress
Validation and Verification	Improve validation and verification on technology projects	In progress
Configuration Management	Improve internal configuration management practices	In progress
Quality Assurance Project	Improve quality assurance on development projects	In progress
Application Architecture		
New Architecture Implementation	Implement production system (Occupational Licensing) based on new architecture with DMV-wide team and business partners	In planning
DMVA Software Conversion	Reengineer front-end processes and develop appropriate software with modern technology	Future
Data Communications Architecture		
Convert DMVA to Frame Relay	Convert field office network to frame relay	In progress
Standardize Network Operating Systems	Convert Headquarters network to standard network operating system	In progress
Synchronize Network Directories	Synchronize network directories centrally	In progress
Expand Intranet/Internet Usage	Expand Intranet/Internet services and products	In progress
Standardize Network Protocols	Convert to industry standard network protocol	In progress
Standardize Network Topologies	Convert to single, industry standard network topology	In progress
Hardware Architecture		
Upgrade DMVA hardware	Replace Series/1 processors with open systems processors	In progress
Replace terminals	Replace dumb terminals with personal computers and network computers	Under review
Organization and Staffing		
Improve Dept-wide Project Management	Improve processes for project initiation, estimation, accounting, tracking, reporting	In progress
Conduct ISD reorganization	Reorganize ISD to support new directions and architectures	In progress
IT outsourcing	Improve effectiveness and lower costs of IT support/management	In progress

SECTION IV

GOALS AND OBJECTIVES

DEPARTMENT OF MOTOR VEHICLES

INTRODUCTION

This section describes our information technology goals, objectives, and strategies over the next 3-5 years. The following definitions are used in this section:

Goals: What we desire and expect to achieve over the next 3-5 years in information technology.

Objectives: Further definitions and clarifications of the goals.

Strategies: How we expect to achieve the goals and objectives.

Performance Measure Categories/Examples: How we plan to measure our progress and outcomes. These will be refined as part of the implementation planning process, including the development of baselines and targets, as appropriate.

Goal #1

Successfully implement departmental projects with information technology components in a timely manner to meet statutory mandates and other identified business needs

Objectives:

1. Meet or beat projected implementation dates for IT projects and IT components of key business projects
2. Complete IT projects and activities within established budget parameters for hardware, software, contract personnel and development time
3. Meet the functional requirements for statutory mandates without rework and/or interim solutions

Strategies:

1. Conduct IT projects as follows:

   - Implement structured project management practices
   - Utilize independent verification and validation, as required by DOIT
   - Improve configuration management practices
   - Implement structured quality assurance practices
   - Utilize standard development life-cycle practices, including methodologies and tools
   - Establish business partnerships with appropriate vendors and agencies
   - Replenish technical skills

Performance Measure Categories/Examples:

1. Number and percentage of on-time projects
2. Number and percentage of on-budget projects
3. Number and percentage of projects which meet all functional requirements

Goal #2

Improve the responsiveness and cost-effectiveness of the information technology infrastructure

Objectives:

1. Utilize industry standards and products
2. Improve the maintainability, flexibility, reliability, scalability and interoperability of the hardware architecture
3. Improve the maintainability, flexibility, reliability, scalability and interoperability of the software architecture
4. Improve the maintainability, flexibility, reliability, scalability and interoperability of communications networks
5. Provide cost-effective, high-performance transaction processing

Strategies:

1. Use commercial off-the-shelf software and information technology industry standards unless impossible or inappropriate
2. Utilize scaleable, vendor-provided products and services, including public network options where appropriate, to provide communications infrastructure solutions
3. Implement departmental Intranet
4. Implement production system based on new technical architectural vision/standards
5. Upgrade aging, unreliable equipment
6. Upgrade network infrastructure, including performance, manageability, interoperability, support, and network performance specifications

Performance Measure Categories/Examples:

1. Increase reliability of hardware, software, and communications infrastructure
2. Reduce recurring costs to support hardware, software, and communications infrastructure
3. Reduce time required to complete software enhancement and change requests

Goal #3

Support and improve business processes and overall customer service by exploring and implementing innovative information technology solutions

Objectives:

1. Utilize innovative IT solutions, as appropriate, to support redesign and reengineering of mission critical business processes
2. Enhance customer service and data accessibility through the use of appropriate voice and data technologies
3. Develop enabling IT solutions to support front-line DMV personnel

Strategies:

1. Reengineer and implement DL processes with appropriate enabling technologies
2. Reengineer and implement VR processes with appropriate enabling technologies
3. Reengineer and implement OL processes with appropriate enabling technologies
4. Implement enhanced computer telephony integration (CTI) solutions and related processes as appropriate to streamline telephone service centers
5. Expand Intranet/Internet products and services
6. Implement new technology, incrementally, in appropriate field offices
7. Reengineer back-end databases

Performance Measure Categories/Examples:

1. Improvements in customer service, e.g., queue time, mean time to service
2. Improvements in efficiency/effectiveness of DMV staff
3. Reductions in time/cost to produce DMV products

Goal #4

Establish and improve tools, methodologies and practices to ensure high quality technology solutions

Objectives:

1. Increase use of commercial, standardized IT tools to promote functionality and maintainability
2. Implement standard project life-cycle methodologies and procedures
3. Increase internal staff skills in IT core competency areas
4. Enhance the accuracy, authenticity, and security of data

Strategies:

1. Implement automated IT tools which best meet our business and technical development requirements
2. Develop and implement procedures to promote a standardized, efficient application development environment (ADE)
3. Establish and maintain documentation on hardware, software, network and documentation standards
4. Establish comprehensive, adaptable security plan
5. Improve quality assurance on development projects
6. Improve configuration management
7. Implement network management software

Performance Measure Categories/Examples:

1. Utilization of automated tools
2. Standardization of project life-cycle methodologies
3. Completion of appropriate training programs
4. Number of security violations detected
5. Electronic inventory of IT assets

Goal #5

Improve the departmental organizational infrastructure for planning, implementing, and supporting information technology solutions

Objectives:

1. Provide strong executive leadership for information technology activities
2. Promote cohesive working relationship of business and technology units
3. Enhance communications and accountability among participants in IT-related projects
4. Develop and implement employee performance metrics and automated measurement tools
5. Design and implement training programs that incorporate information technology as a core competency

Strategies:

1. Explore reorganization of business and technology relationships to improve coordination and control
2. Utilize technology to assist in overall employee performance measurement
3. Provide employee training (including cross training) and/or contract resources to ensure efficient and effective support of information technology infrastructure and application development
4. Improve processes for project management, including initiation, estimation, accounting, tracking and reporting
5. Implement customer satisfaction contracts

Performance Measure Categories/Examples:

1. Reduction in rewrites of needs analyses
2. Number of training programs completed
3. Reduction in cycle times to implement IT solutions
4. Customer/employee satisfaction
5. Industry comparisons/performance metrics

SECTION V

CONCLUSION

DEPARTMENT OF MOTOR VEHICLES

Information technology is a key component to the future success of the DMV in meeting its business goals. In the next three to five years, we have the task of implementing statutory mandates while concurrently upgrading the overall technology infrastructure to improve customer service and efficiency.

Many significant improvements are already underway. We are employing an incremental approach to improving information systems, addressing the highest priority issues via initiatives that are controlled and measurable to ensure progress and mitigate risks.

The Strategic Information Technology Plan outlines the strategies that will be employed to make key incremental improvements in the future to achieve our business and IT goals and objectives.

Business process reengineering plays an important role in DMV business and technology strategies. Business process improvements will be implemented incrementally over the next few years, working in parallel with improvements in information technology.

From an IT infrastructure perspective, an important objective is to implement a production system that is based on the new technical architecture. The initial target is a new Occupational Licensing System. This project, which will incorporate business process reengineering, will be conducted by a multidisciplinary DMV team with business partners.

In addition, we are upgrading the organizational infrastructure to provide better support for information technology in the future. A project is in progress to improve our application development environment methodology. Deliverables will include standards, procedures, and guidelines. A Project Management Office has been created to provide better control and accountability for all projects, including technology-related initiatives. Other initiatives address opportunities for improvement in configuration management, quality assurance, and verification/validation.

This Strategic Information Technology Plan is based on a solid foundation of business planning efforts that have taken place over the past two years. It describes today's vision for

information technology, and it includes processes for refining the vision in the future. An implementation plan will be developed by the third quarter of 1997 which will identify specific initiatives, roles and responsibilities, and timeframes to meet the goals and objectives of the Strategic Information Technology Plan.

APPENDIX A

GLOSSARY

DEPARTMENT OF MOTOR VEHICLES

AAMVA – American Association of Motor Vehicle Administrators

AAS – Automated Appointment System, a computer-based application

ABIS – Automated Billing for Information Services, a computer-based application

ADABAS – A commercial database management system

ADE – Application Development Environment

Architecture – A blueprint or framework for technology to guide future planning and initiatives

ARMS – Accounting and Resource Management System (ARMS), a computer-based application

ANI – Automated Name Index, a computer-based application

Bandwidth – Amount of information that can be transmitted over a specific network link, i.e., a measure of network performance

BPR – business process reengineering

CAMVDCS – California Motor Vehicles Data Communications System, i.e., message switch software

CDLIS – Commercial Driver Licensing Information System, a computer-based application

CICS – Transaction processor software provided by IBM

COTS – Commercial off-the-shelf

CTI – Computer telephony integration

DL – Driver Licensing

DMVA – Department of Motor Vehicles Automation – a term used to describe the project, network, and equipment serving the field offices, including Series/1 processors

Frame relay – A high-speed, bandwidth-on-demand data communications transmission technology

IEEE – Institute of Electrical and Electronic Engineers

Independent Study – The Business Applications and Information Technology Independent Study conducted by The Warner Group, published in May 1995

Interoperability – Ability for one system to communicate or work with another.

IRP – International Registration Plan

IT – Information technology

ITSC – Information Technology Steering Committee

IVR – Interactive Voice Response, a technology which facilitates interaction between a telephone user and a computer system

JAD – Joint Application Development

JRD – Joint Requirements Development

LAN – Local area network

MONARCH – The DMV's business process reengineering project

MVS – An operating system from IBM, used primarily on mainframes

OL – Occupational Licensing

RLA – Rental Leasing Application, a computer-based application

RTC – Real Time Control, the DMV's custom transaction processing software

SBP – Strategic Business Plan

Scalability – Ability to expand

Series/1 – An IBM minicomputer used for front-end processing of core applications at field offices and at Headquarters.

SITP – Strategic Information Technology Plan

SNA – System Network Architecture

SYBASE – A commercial database management system

TCP/IP – Transmission Control Protocol/Internet Protocol, a de facto industry standard data communications protocol

VR – Vehicle Registration

VSAM – Virtual Storage Access Method, an IBM file access methodology

WAN – Wide area network

APPENDIX B

STRATEGIC INFORMATION TECHNOLOGY
PLANNING METHODOLOGY

DEPARTMENT OF MOTOR VEHICLES

A. BACKGROUND

The background for this current SITP includes our last SITP effort in 1994, and the Business Applications and Information Technology Independent Study completed in 1995.

Previous SITP - 1994

The primary strength of the 1994 DMV Strategic Information Technology Plan was the clarity of its theme: the integration of business and technical strategies. It presented clear goals and a high-level approach for addressing many of the key business issues we face, as outlined in our 1993 Strategic Business Plan.

In addition, the 1994 SITP met two important objectives of a strategic IT plan: 1) it established an organizational focus and a common direction; and 2) it identified internal and external factors directly affecting the success of the mission. The SITP clearly stated our intent to integrate business and IT strategies, and to coordinate business and IT decision-making.

As a result of the 1994 SITP, we have changed how we manage IT. The Information Technology Steering Committee has made business managers an integral part of IT decision-making at the highest level of the organization. Through Joint Requirement Development (JRD) and Joint Application Development (JAD) sessions, business managers are much more involved in IT development and decision-making processes.

Business Applications and Information Technology Independent Study - 1995

The Department of Motor Vehicle's Business Applications and Information Technology Independent Study was undertaken to determine the appropriate direction for IT at the DMV.

The Independent Study has been used as our *de facto* SITP pending the development of the 1997 SITP. The key objective of the Department of Motor Vehicle's Business Applications and Information Technology Independent Study conducted by The Warner Group was to develop an implementation plan for moving forward with information technology (IT) improvements. In reviewing our business environment, the Independent Study identified key

business issues that we will be confronting in the years to come.

The Independent Study cautioned that we need to take immediate steps to upgrade our mission critical systems, including the driver license, vehicle registration, and occupational licensing systems which are largely supported by mainframe-based applications with in-house, custom-developed software. The study also emphasized the critical need to develop and implement an upgrade strategy for our 347+ obsolete Series/1 processors in all field offices and at headquarters.

The Warner Group recommended both *future technical directions* in many key areas, as well as *processes* which would lay the foundation for future steps and technical directions.

Finally, the Independent Study concluded that we face an extremely difficult information technology challenge and as a result, must determine our future business and technical systems requirements, refine our IT architectural vision for the future, and develop a migration strategy to move in the desired direction.

The 1997 version of the SITP builds on the foundation of the 1994 SITP and the improvement opportunities identified in the Independent Study and other planning initiatives. The 1997 SITP focuses on issues at the strategic level. It clarifies the priority, performance measures, and estimated timeframes for major improvements, and provides a framework for subsequent tactical planning efforts.

B.   1997 STRATEGIC TECHNOLOGY PLANNING APPROACH

The planning process for the SITP began in September 1996, with a Readiness Assessment which identified our executive management's expectations for the SITP. Interviews and focus group sessions were conducted by a planning team with key executives and key internal and external stakeholders. These meetings identified the critical operational and IT issues we face, as well as our IT strengths, weaknesses, opportunities and threats.

Technology issues were further researched to identify and understand them in terms of our current technology environment. The SITP planning team then assessed our future technology needs based on our business issues and requirements and an analysis of our strategic initiatives and documents such as the Director's Imperatives, the Strategic Business Plan, and the MONARCH Project's Vision, Themes, and Stretch Goals.

The results of these analytical processes established the foundation for the future vision, goals and objectives in the Strategic Information Technology Plan. Following the publication of the SITP, an implementation plan will identify the specific tactics required to implement the SITP goals and objectives. This approach will assist us in prioritizing the strategies, identifying resources and timelines to accomplish them, and determining the appropriate feedback and control mechanisms for evaluating progress and performance during the implementation.

C.   INTENDED AUDIENCE

Identification of the intended audience for the SITP is extremely important. The plan should communicate future IT directions and strategies to staff throughout the Department. Equally important, however, the SITP should convey to control agencies and other external stakeholders our architectural priorities and strategies, thus providing an "umbrella" for specific IT initiatives in the future. Internal and external stakeholders include the following:

Internal Stakeholders

- DMV executive management
- DMV staff

External Stakeholders

- Citizens of California
- State Legislature
- Business, Transportation and Housing Agency
- Department of Information Technology (DOIT)
- Department of Finance (DOF)
- Teale Data Center
- Legislative Analysts Office (LAO)
- Law enforcement and criminal justice, including Department of Justice, courts, and many other agencies
- American Association of Motor Vehicles Administrators (AAMVA)
- Other State agencies, including Franchise Tax Board, Board of Equalization, Bureau of Automotive Repair
- Local government
- Industry partners to the DMV, including insurance, trucking, banks, and others
- Many others

To solicit input from internal and external stakeholders regarding this update to the Strategic Information Technology Plan, issues and challenges we currently face, and strategic opportunities for improvement, a planning team conducted a series of executive interviews, work sessions with program staff and interviews with key external stakeholders. Listed below are key observations and themes from this process, as follows:

- *Reflect Director's Goals, Strategic Business Plan and Vision Themes* - The SITP update should incorporate and integrate the Director's goals, objectives and strategies identified through other recent and ongoing planning projects, and relate these separate but related concepts to a global information technology plan which encompasses all areas of technology which we could utilize.

- *Identify Strategic and Tactical Direction* - The initial SITP identified issues and high-level direction for change, but did not provide a detailed plan for implementing change. The SITP update should define the optimal information technology environment and provide for an incremental implementation to migrate to that optimal environment.

- *Define Comprehensive Technical Direction* - The strategic and tactical plans identified above should set a comprehensive technical direction which focuses not just on front end and/or back end solutions, but also includes networking, previously identified infrastructure projects, and a plan for incorporating the Internet into the overall business strategy.

- *Provide Framework for Business to Guide Technology* - The emerging technical architecture and supporting organizational structure should facilitate evolution to a flexible information technology environment which is driven by our business needs. Additionally, buy-in and commitment to business-driven technology must occur throughout our Department.

- *Recognize Alternatives to Series/1* - The Series/1 replacement process offers a significant opportunity to change and improve how we conduct business with the public, and should involve a shift in focus from the needs of the system to the needs of the users.

- *Encourage Partnerships* - The SITP update must re-emphasize the importance of internal as well as external partnerships, including information technology managers and program managers, headquarters and field office personnel, our staff and automobile dealerships and insurance companies.

- *Identify "Owner" of SITP* - An "owner" of the SITP is needed to provide ongoing visibility and track progress and to ensure that roles and responsibilities are fulfilled.

- *Develop Comprehensive, Flexible Information Technology Support Structure* - We need to staff and train (and cross-train) our Information Systems Division (ISD) organization to enable streamlined response to development and maintenance requests

and to offer varied technical alternatives rather than just mainframe solutions.

- *Capture and Build on "Institutional Knowledge"* – We have a tremendous, undocumented resource in the knowledge gained by technical staff over decades of interactions with systems and applications. Cross-training undertaken in conjunction with a documentation effort is needed to capture this "institutionalized knowledge" and develop automated business rules as our key personnel are now approaching retirement.

- *Recognize Strength of DMV Staff* - Several stakeholders noted that one of our greatest strengths is our people and their commitment to complete the work of the organization despite the current information systems. The strength and commitment of our staff should be leveraged as part of the implementation plan.

- *Transition from Document Processing to Customer Focus* - We need to migrate our organizational and technical focus from document processing to a full customer service focus. To accomplish such a transition, expanded decision making authority, along with supporting systems and tools, are needed in our field offices.

- *Recognize Political Challenges* - We face ongoing political and statutory challenges relating to past projects, upcoming elections and statutory mandates. While we must constantly adapt our business practices and associated technologies to meet statutory mandates, more proactive interactions or partnerships with the legislature could enable a better understanding of the technical impacts of mandates and result in more realistic mandated implementation timeframes.

- *Take Appropriate Risks* - Some believe that we are proceeding too cautiously and tenuously, and note that our organization and our new Director need a visible success. A project offering real, measurable impact should be selected, undertaken and successfully completed in a manner which will demonstrate a business case for technology for the new administration.

- *Recognize Requirement for Strategic Plan for Consideration of Budget Requests* - The Department of Finance (DOF) requires all state agencies to develop strategic plans by July 1, 1997. Beginning in fiscal year 1998-99, funding requests submitted through the budget process must be linked to specific objectives of organizations' strategic plans.

- *Anticipate Funding Issues* - An incremental approach to technology improvements is the most sound, cost-efficient strategy, but there is the danger that future phases will not be funded. Additionally, pressure on the Motor Vehicle Account in the State Transportation Fund may limit opportunities to fund new initiatives. As a result, we must continuously seek alternatives to generate savings through enhanced efficiencies.

- *Manage Software Backlog* - Stakeholders express frustration with the significant backlog of programming requests, partial efforts undertaken to meet statutory mandates, and the resulting impacts on business operations. Greater efficiencies in processes and systems should be sought so as to enable a more responsive turnaround time for project requests.

- *Improve Project Management Skills* - Project management capabilities throughout the

DMV, not just within ISD, should be improved. While better technical project management skills are needed, business project managers are also needed to ensure the proper coordination of departmental efforts. We should invest the time and related resources needed to enable our managers to better manage complex projects.

- *Heighten Respect* - Better mutual appreciation and respect are needed between IT staff and business staff. To improve the culture, a deliberate strategy for better focusing activities and improving project communications, implementations and testing should be undertaken.

- *Create an Atmosphere of Learning* - As we focus on improving our processes, systems and infrastructure, a parallel project of training and exploration should be undertaken to learn about other states' technology initiatives and incorporate their experiences, and to thoroughly familiarize our staff with evolving changes and their benefits to the work environment.